

The Big Dig

Clearing the Manawatū Gorge Slip

by Wayne Erb



19 August 2011

A winter's night – and heavy rain is pelting down, soaking into the steep hillside of the Manawatū Gorge. Eventually, the ground can hold no more water. A torrent of rocks and mud pours down, burying the highway and spilling into the Manawatū River. When road workers see the slip the next morning, they say it will take a week to clean up. They are wrong. Getting the highway open will take over a year – and an incredible amount of work. It's one of the biggest slips in New Zealand's history.

The Manawatū Gorge

The Manawatū Gorge cuts a deep course between the Ruahine and Tararua ranges. The first road was built in 1871, and rail connected Manawatū to Hawke's Bay in 1891. Although an important route, the gorge has seen trouble before. In 2004, a storm led to several landslides, which closed the road for seventy-five days.

But this latest slip was something else, and work began straight away. Diggers were used to dump rock into removal trucks, but as they worked, more rocks and earth slid down. Meanwhile, detours for the traffic were established over the Saddle Road and the Pahiatua Track. Travel took up to twenty minutes longer on these narrow, winding routes. Trucking firms faced higher fuel costs. People needed to leave earlier for work and trips. Everyone wanted the road cleared quickly. But the problem was about to get worse.



The Slip Gets Bigger

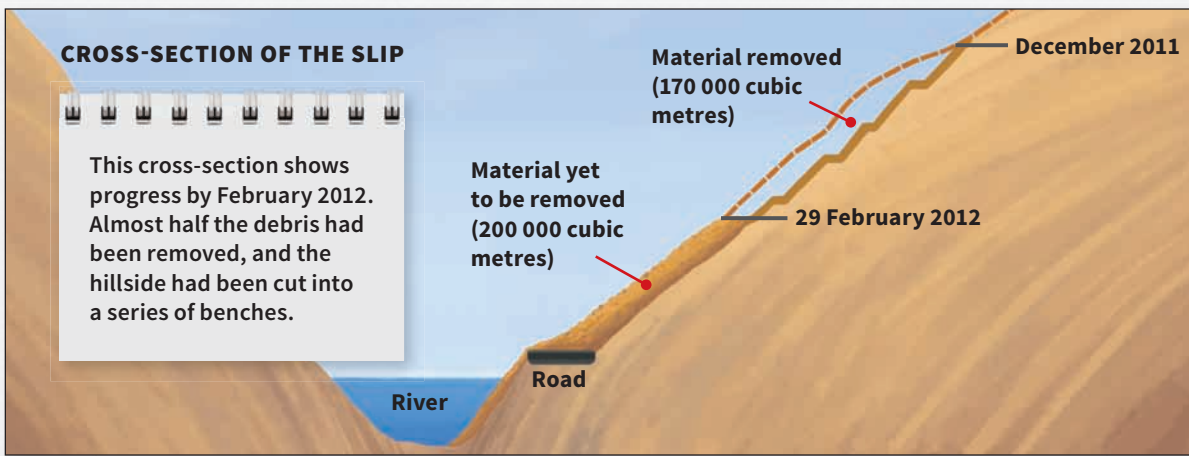
In October, torrential rain sent even more debris crashing down – 20 000 **cubic metres** of it. (That’s equal to eight Olympic swimming pools.) David McGonigal, the New Zealand Transport Agency’s state highways manager, stopped work because it was too dangerous to operate machinery at the base of the slip. No work could be done for two weeks.

As well as delays, David also faced a quandary. The road couldn’t be reopened until the hillside was stabilised. But how should this be done? A team of **engineers** and **geologists** examined the slip and used **lasers** to map the hillside. They learnt there was more unstable material higher up. This meant the loose rock and soil would need to be dug out from the top down. The experts decided to cut the landslide into a series of benches, a bit like giant steps. These benches would stabilise the hillside, reducing the risk of future slips. So workers formed a track through farmland and bush to reach the top of the slip. Then it was time to bring in the Bandit.

The Bandit was a grunty bulldozer whose scoop had been replaced with a big **winch** and heavy-duty cables. It was taken to the hilltop, where it was half-buried in the ground so that it wouldn’t budge, no matter what. Heavy diggers were then lowered down the unstable slope while the Bandit held them in place with its mighty cables.



Burying the Bandit ►



Hard Work

In the days before Christmas, everyone was still hard at work. At the road level, a 20-tonne digger scooped up great masses of rock and earth. A loader dumped the loose material into trucks, which came and went up to 250 times a day. Because there was so much activity, people were assigned as spotters. They used binoculars to scan the hillside for any unstable boulders and had radios to warn of danger.

Changeable weather made working on the slip tough. David McGonigal says that some days, gale-force winds and rain

would replace the sunshine in a matter of minutes. “The team was up there a hundred metres above the road, using heavy machinery, completely open to the full force of the wind,” he recalls. When it rained, the slip’s surface turned to mush.

Workers did all the right things to stay safe, but it was still tough going. “The site was pretty hard to access,” David says. “It was a fifteen-minute climb up a steep slope. Crews had to use a rope to pull themselves up. We had to chopper in our supplies – even the portable toilets!”

A Long Wait

In early 2012, the public was told that the highway would remain closed until the middle of the year. It was a long wait – but the road had to be made safe. Some people were affected more than others. Businesses in Woodville had fewer customers; Ashhurst residents had to cope with all the extra traffic that was detoured through their town. These roads weren’t built to cope with heavy traffic, and they needed frequent repairs.

The third and fourth benches were dug into the hillside, and after that, the Bandit was no longer needed. This meant that the machines had to keep going and dig all the way down to the road. There was no other way off the hillside. And so the digging continued. By the time the slip was finally cleared, 370 000 cubic metres of rock and earth had been trucked away. If that doesn’t mean anything ... imagine Wellington’s stadium filled with so much dirt that it spills out over the roof.

The third and fourth benches are cut into the hillside. ▼





One Step Forward, One Back ...

By May, the team had benched the hillside and cleared the slip from the road. Shortly afterwards, workers levelled a stretch of temporary road. This meant that cars could travel in one direction only, while the repair work wrapped up.

It sounds like the end of the story – but it wasn't. Heavy winter rain caused the Manawatū River to rise 7 metres above its normal level. The floodwater washed away the rock beneath the temporary road. Once again, no one could drive through the gorge. Several bridges had to be completely replaced before the road could reopen. Other teams worked to reduce the risk of new slips. They used a method called “rock anchoring” – inserting large steel rods into the slip face to help secure it. They also laid netting to catch falling rocks and dug channels to drain rainwater into the river.

The All-clear

The Manawatū Gorge road was reopened to some traffic in August 2012. It was opened to all traffic in September. But still the work wasn't quite over. There was a minor rockfall farther along the gorge, and so the highway was closed for one more day while crews blasted large boulders into smaller pieces so they could be removed. Finally, fifteen months after the first landslide, David McGonigal announced that work to restore the gorge road was complete, saying, “No slip in New Zealand's modern history has had such an enormous impact and affected so many people.”



GLOSSARY

cubic metre: an amount of material that would fit into a cube that is 1 metre across on each side

engineer: a person who designs things like roads and buildings

geologist: a person who studies the earth through its rocks

laser: an extremely bright light that can be used for measuring and cutting

winch: a machine that hauls things using a cable

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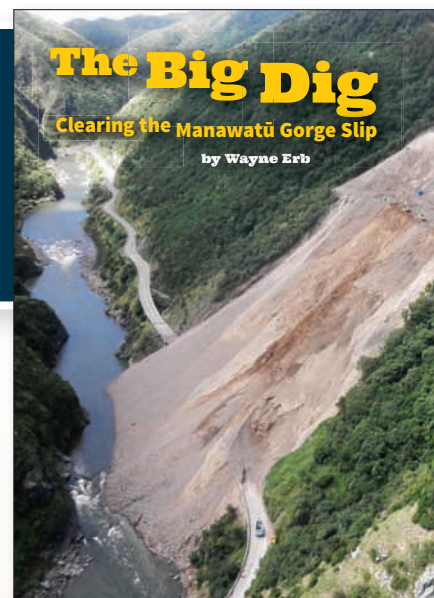
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